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**Are booms and
depressions transmitted...**

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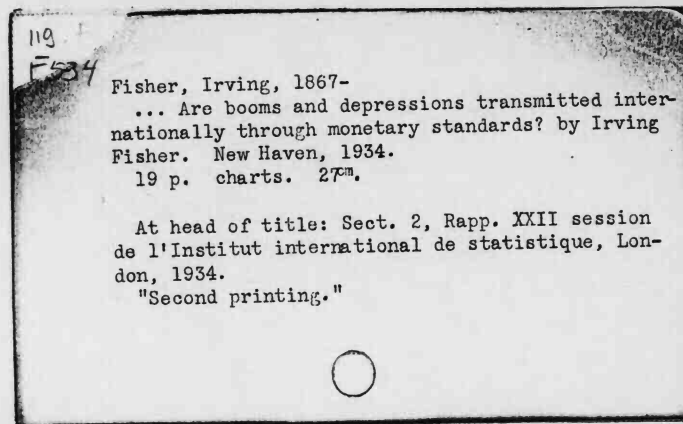
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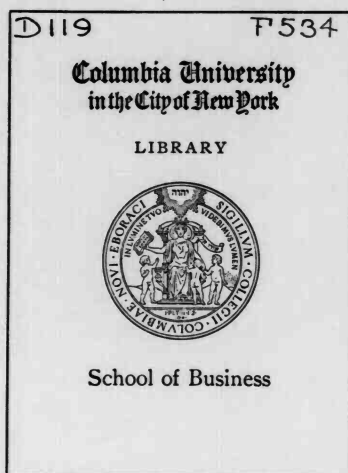
XXII SESSION DE L'INSTITUT
INTERNATIONAL DE STATISTIQUE
LONDON, 1934

ARE BOOMS AND DEPRESSIONS
TRANSMITTED INTERNATIONALLY
THROUGH MONETARY STANDARDS?

by
IRVING FISHER

NEW HAVEN, CONN., U. S. A.
1934

SECOND PRINTING



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Additions and Corrections

In this printing there is added, on the last page, Chart 13, which gives the individual countries of "Sterlingaria" omitted in Chart 9, except South Africa for which monthly data are lacking.

The order of the curves appearing in Chart 1 has been changed and this revised order has been carried through Charts 2, 3, 12B, and 12C.

In Chart 3 the curve for Union of South Africa has been corrected.

ARE BOOMS AND DEPRESSIONS TRANSMITTED INTERNATIONALLY THROUGH MONETARY STANDARDS?

By Irving Fisher, LL.D.
Professor of Economics, Yale University

(For help in the preparation of this paper, I am under special obligation to Miss Katherine Tracy.)

At the Mexico meeting of the International Statistical Institute in October 1933, I presented a paper on "The Debt-Deflation Theory of Great Depressions." A Commission was then constituted to continue the study of the subject, especially from the standpoint of method. Dr. Karl Pribram was appointed the rapporteur.

As a member of that Commission, I was asked to report on one special phase of the subject, namely the international transmission of booms and depressions, with special reference to monetary standards and price levels, and also with special reference to the most appropriate methods for studying the relationships involved.

In attempting to carry out this task, I have gathered data from some 40 countries. I shall confine my present report, however, to those countries for each of which I have data on at least:

- (1) monetary standard
- (2) price level
- (3) business conditions, including depressions.

These three, according to the evidence to be presented, represent three stages of an economic process: "1" transmits the movements of "2" from one country to another; "2" influences "3" within each country. It follows that when several countries have a common monetary standard (be it gold, silver, sterling or any other) they must expect similar price movements which in turn will strongly influence the movements of business within the several countries. This amounts to saying that booms and depressions are transmitted internationally through monetary standards.

The only countries which I have found to afford these three sets of data are 27 in number, namely:

Argentina	England	New Zealand
Australia	Finland	Poland
Austria	France	Norway
Belgium	Germany	South Africa
Canada	India	Spain*
China*	Italy	Sweden
Czechoslovakia	Japan	Switzerland
Denmark	Mexico*	United States
Egypt	Netherlands	Yugoslavia

*For China, Mexico, and Spain the depression data available for other countries were lacking.

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To prepare the ground for this study, the 27 countries were first classified into certain groups,* according to their monetary standards. These groups are three in number, as follows:

(a) Those countries maintaining a constant price of gold in a free market and those maintaining a (nearly) constant rate of exchange on such countries. Thus, besides gold standard countries, this group includes those countries using the gold exchange standard, or some variant thereof.

(b) The so-called "Sterlingaria", i.e. those countries now maintaining a (nearly) constant rate of exchange on London.

(c) Miscellaneous, including, among others, China,** which is on the silver standard, and Sweden, which is on a commodity-index standard.

Chart 1 gives a clear picture of the changes in monetary standards from 1929 to 1933, as it gives for each country the price of gold in terms of the currency of that country. As long as the country is in Group (a), its curve representing the price of gold is practically a horizontal line. The curves for those countries which thus virtually maintain the gold standard throughout are at the bottom of the chart and are labeled (at the right) "gold countries". The middle group of curves represents "Sterlingaria" and the top group marked "miscellaneous" represents the remaining countries.

As border-line cases, between the top and the middle group, are Canada, Austria and Sweden, for which the two classification brackets overlap (in dotted lines). In a Bulletin of the Midland Bank (Oct. - Nov. 1933), Canada is classified with "Sterlingaria" but the classification is acknowledged to be doubtful, because "the Canadian dollar has tended to fluctuate with the United States dollar rather than with the pound." The classification of Sweden in "Sterlingaria" is also doubtful, for, while she has endeavored to keep her exchange on London steady, this has been a secondary consideration in her monetary policy as compared to maintaining steady her internal (retail) price level. Austria, apparently, has never been included among "Sterlingaria"; but her curve in Chart 1, as well as the curves in Charts 3 and 9, give strong internal evidence that she has endeavored to maintain a steady rate of exchange on London.

It will be seen that the members of the miscellaneous group show very little similarity after going off the gold standard, whereas the

*Because of changes in its monetary policy, a country may, in different periods, appear in different groups.

**The only other countries now on a silver standard are Hong Kong and Ethiopia, for which no data were found.

members of the sterling group continue to resemble one another markedly.

After the countries were classified in this way, four methods of study were pursued:

I Within each group of countries having a common monetary standard, their price levels were compared.

II Between groups comparisons were made.

III In transition from one group to another (e.g. from gold to "Sterlingaria") the transitional changes in gold price and price level of each country were studied.

IV Within any one country the behavior of its price level was compared with the behavior of its depression.

These four methods will be taken up in order.

Method I: Comparisons Within The Same Monetary Group.

These comparisons can best be made by means of charts.

Chart 2 shows the wholesale price index numbers* of countries while on (or virtually on) the gold standard—that is, as long as the curves representing the price of gold run horizontally (as per Chart 1). It will be noted that all countries, as long as they maintain a constant price of gold, have falling price levels, and that these price levels usually fall at nearly the same rate. This is remarkable in view of (1) wide differences in the index numbers used, many of which are very faulty, and (2) trade obstructions such as tariffs and freight costs. The two countries most out of line with the rest are New Zealand and Australia and these differ from the rest in having at least twice raised the price of gold in the period covered. (See Chart 1.) This action tended to raise their price levels. New Zealand succeeded to the extent of making her curve (See Chart 2) more nearly horizontal than any other curve in the chart. Australia did not succeed in doing this in the period covered in Chart 2 but did later (See Chart 3).

Chart 3 shows the index of wholesale prices for "Sterlingaria". We see that the curves are (1) similar, and (2) more nearly horizontal than the curves for the gold countries.

Chart 4 shows the indexes for "miscellaneous" countries, namely, one silver standard country, China, and six others without any fixed standard.

*Price level statistics for Charts 2, 3 and 4 were taken from the League of Nations' Monthly Bulletin of Statistics, Geneva, 1929-1933, except in four cases: The statistics for Argentina are from Banco de la Nación Argentina; for China, from Nankai Statistical Service; for Spain, from Institut d'Investigacions Econòmiques, Barcelona; and for Mexico, from Revista de Economía y Estadística.

From these charts we see that the price level curves of all gold countries show a strong "family" resemblance, as do those of "Sterlingaria". But the two "families" are quite different, and as soon as any country separates from the gold group, its price level loses the characteristics of that group and acquires the characteristics of the group which it joins.

On the other hand, the "miscellaneous" countries (represented in Chart 4) show little or no family resemblance. They do not constitute any one family but rather a managerie of different species, differing both as to the price of gold and as to the price level of commodities.

There are distinct differences between the commodity price levels of different groups, that is, between "gold" and "sterlingaria"; "gold" and "silver"; "gold" and "commodity"; "silver" and "sterlingaria"; "silver" and "commodity". Only between "sterlingaria" and the "commodity" country is the dissimilarity slight.

We conclude: Countries with like monetary standards have like price movements.

Countries with unlike monetary standards have unlike price movements.

In my book, *Stabilizing the Dollar*, published in 1920, I reached similar conclusions (p.24), as did Warren and Pearson in their great study, *Prices*, published in 1933.

Method II: Inter-Group Comparisons.

These comparisons should show why countries of one monetary group have price level experiences so different from the price level experiences of other groups. First, let us examine the price levels of two groups of countries whose currencies are based on two different metals—gold and silver. We may take France and the Netherlands as representative of the gold countries and China as representative of the silver countries.

Chart 5 gives these comparisons. The upper curve shows the wholesale commodity price index of China. In contrast with this silver curve, the next two curves below show the price levels of typical gold countries. The undotted curve is for the Netherlands and the dotted for France. Each has claims to being the most typical gold standard country; but the Netherlands seems slightly preferable for international comparisons, because of being more nearly a free trade country. At first, let us disregard the dotted curves entirely. The undotted curve next below gives the price level of China measured relatively to the price level of the Netherlands; or,

in more exact language, it gives the ratio of the index number of wholesale commodity prices in China to the index number of wholesale prices in the Netherlands.

The bottom curve gives the price of gold measured in silver, that is, the rate of foreign exchange between China and the Netherlands or, more generally, the rate of exchange between any silver standard country and any gold standard country. From the similarity of these two curves, we see that the ratio between the Chinese price level and the Dutch price level is reflected in the ratio between their monetary standards. From the dotted curves, we see that the same proposition holds true if, instead of the Netherlands, we use France as the typical gold country, and the same would hold if almost any other country in the gold group were used.

Chart 6 makes the same comparisons between the gold group and the sterling group, Netherlands and France (dotted) representing the gold, and England representing the sterling. Here the similarity is even more striking. That is, the price level in a sterling country, measured relatively to the price level of any gold standard country, is similar to the price of gold in the sterling country measured in sterling.

Chart 7 compares, in the same way, the Mexican price level, measured relatively to the Dutch, with the price of gold (or the price of the Dutch gold gulden) in Mexican currency.

Chart 8, likewise, compares the Mexican price level measured relatively to that of the United States, with the price of the United States dollar in Mexican currency.

Both these Mexican charts show the similarities in question, but the similarity with America is the greater, due, doubtless, to closer trade relations.

I strongly suspect that some of the Mexican data are untrustworthy, or that the bigger disharmonies in the curves have some special explanation which does not appear on the surface.

We have noted inter-group comparisons between silver and gold countries (Chart 5), between "sterlingaria" and gold (Chart 6), between Mexico and gold (Chart 7); between Mexico and the United States (Chart 8).

These are only types of the various inter-group comparisons possible. For instance, we might compare China with 23 gold-standard countries instead of merely with the two taken in Chart 5, as typical samples. In the same way, we might compare each of 9 "sterlingaria" countries with each of 11 gold countries, making

99 gold-sterling comparisons, instead of merely the types taken in Chart 7.

If each of the 27 countries were compared with each of the other 26, there would be altogether 351 comparisons possible, analogous to those of Charts 6, 7 and 8.

But, having classified the countries into monetary groups and having compared a typical country of one group with typical countries of another, it would seem that we have given most types of comparison needed. The miscellaneous group, however, will receive more detailed treatment.

Chart 9 gives similar comparisons for the "miscellaneous" countries, except those already given. In the case of each country, there are two curves, one giving the price of gold in terms of the monetary standard of that particular country, and the other, giving the wholesale price level of that country measured relatively to the price level of a typical gold country, namely the Netherlands.

From all the above comparisons, we conclude that the divergence between the price levels of any two countries that differ in monetary standards, approximately corresponds with the divergence between those two monetary standards. This principle really includes, as a special case, the case of countries on the same monetary standard, where the divergence is practically zero. In short, price levels among nations behave, in general, according to their monetary standards.

Method III: Transition From One Group to Another.

Chart 1 (the price of gold chart) shows that, as soon as any country went off the gold standard, its price of gold shot up. On Chart 2 (wholesale price levels of gold countries) each country that leaves the gold standard has its price level curve extended forward* by a dotted line to show the behavior of prices in the six-month period immediately succeeding its departure from gold. It will be seen that in most cases the commodity price level rises simultaneously with the price of gold. The only notable exceptions are Mexico (whose price level goes down while her price of gold goes up markedly), Argentine (whose price level also goes down but only slightly), Yugoslavia (whose price level goes down for a very short period before going up), and New Zealand (whose price level keeps horizontal).

*In Charts 3 and 4 the same curves are extended backward six months by dotted lines. Thus, the transitions from gold to sterling and from gold to "miscellaneous" are shown twice—forward in Chart 2 and backward in Charts 3 and 4.

The following countries have price levels which go up after their departures from the gold standard, but only slightly: Canada, Austria, Sweden, Norway and Australia. The cases of New Zealand, Australia and Sweden would seem to be explained by the definite efforts of those countries to control their price levels. I suspect that the same is true of Argentine, Yugoslavia; Norway, Austria and Canada, but I have no direct evidence. Mexico is the most puzzling case.

The three facts: (1) that countries on the same monetary standard have similar price movements; (2) that countries not on the same monetary standard do not have similar price movements; (3) that any country changing from one monetary standard to another changes its price level accordingly—make the case for the monetary transmission of price level changes fairly complete.

This logic is analogous to the logic behind hydrostatics. Consider three cases: (1) the levels of a group of lakes, connected by canals, fall or rise together; (2) isolated lakes, without such canal connections do not fall or rise together; (3) when we close a "lock" in a canal, the level of a lake thereby isolated changes its behavior. It is obvious in these three cases that the presence or absence of the canal connection or the breaking of that connection explains why the levels are alike, different, or change. This analogy is well nigh perfect except as to fluidity.

It is still theoretically possible that these results are coincidences or that non-monetary causes—production, crops, supply and demand, tariffs, wars, and political upheavals—may explain all the similarities and differences of the price level movements. The similarities might conceivably follow from some common cause such as sun spots. Yet such hypotheses need specific proof before we can accept them and reject the more probable explanation of monetary transmission. It is, however, probable that many minor similarities and differences remain which are explainable and explainable only on non-monetary grounds.

We conclude that, with a few exceptions (some if not all of them explainable), a rise or fall in the price of gold is accompanied immediately* by a rise or fall in the level of commodity prices.

This principle was stated and verified statistically in *Stabilizing the Dollar* (see, especially, pp. 26-28). It was discussed and further verified by Professor Gustav Cassel in *Money and Foreign Exchange*

*In these days of telegraph, radio and trans-atlantic telephone, transfers of credit and changes in prices take place in a day or week, where a generation ago they might have taken a month or a year.

After 1914, published in 1922 — he called it the principle of purchasing power parity. Warren and Pearson discuss it in *Prices*.

It will be noted that some countries (Argentina, Australia, New Zealand), after leaving gold, return to it and again show a horizontal line in Chart 1 but at a higher level. Such a voluntary and official rise in the price of gold seems always to be followed by a rise, or arrest of fall, in commodity prices.

Method IV: Comparisons within any one country.

Thus far we have found that price levels are communicated from one country to another largely by monetary standards. We have now to consider whether price level movements within a country affect business conditions, including booms and depressions.

I made certain studies a number of years ago as to the chief business factors associated with booms and depressions: (1) volume of trade⁹, (2) employment¹⁰ and (3) business failures¹¹. Those relating to employment I brought down to date for the meeting of this Institute in Mexico¹², and I have again brought them down to date for this meeting.

In Charts 10, 11 and 12, the symbol \bar{P} represents what the distributed and weighted effects of the antecedent price changes would be upon E (employment) or T (trade), if the price changes were the only cause of the changes in E or T.

The method of deriving \bar{P} from P (the price level curve) is explained in a footnote¹³ on the following page.

This makes the third time that the original study of 1922 as to employment (E) has been extended; and each time the correlation between the two curves¹⁴ continues to be striking, despite the fact that in no case was any attempt made to change, or improve upon, the original method of distributing the lag.¹⁵

⁹"Our Unstable Dollar and the So-Called Business Cycle" *Journal of the American Statistical Association*, June 1925, pp. 179-202.

¹⁰"A Statistical Relation between Unemployment and Price Changes". *International Labour Review*, June 1926, Vol. XIII, No. 6, pp. 1-10.

¹¹"The Unstable Dollar as a Factor in the Credit Man's Problem", *Bulletin of Robert Morris Associates*, July 1927.

¹²"The Debt-Deflation Theory of Great Depressions", *Econometrica*, Vol. I No. 4, October, 1933, pp. 337-357.

¹³Namely E (employment) and \bar{P} (what employment would be if its fluctuations were solely due to the effects of price level changes "according to theory"). The "theory" is that \bar{P} (price level change) in any month distributes its effects on employment over future months according to a definite law and that the \bar{P} (or total effect at any one time) is the sum of the effects at that time of all previous \bar{P} 's. \bar{P} is thus a weighted average of preceding \bar{P} 's, the weights diminishing the further back these \bar{P} 's lie.

¹⁴P (the price level) is measured by the index number of wholesale prices computed by the United States Bureau of Labor Statistics, while \bar{P} and \bar{P} are derived from P.

E is based on the monthly index of manufacturing employment, computed by the Federal Reserve Board, adjusted for seasonal variations.

¹⁵This is very important from the standpoint of argument. Some, who have not understood the philosophy of selecting that particular \bar{P} which has the maximum correlation with T (or the maximum with E), have hastily concluded that the high correlations thus found were of little significance. It has seemed to such skeptics that the correspondences were forced. But even if this argument were sound, as applied to the periods of time originally studied, it certainly ceases to apply when we come to the later periods. The very same formula, "selected", if you will, for the original periods and chosen with the aid of the statistical data pertaining to those periods, is now applied to new periods without the aid of the new data for said new periods and yet the curves still fit. In this case there can be no forced "curve fitting", real or imagined. With this in view, I have, in the present case, purposely refrained from making any adjustments whatever in the original formula, so that, for the satisfaction of myself as well as of the critics, I might discover whether the formula best fitted to one period can be taken, ready made, and applied to another period.

But to an audience of mathematical statisticians, I need not argue the propriety of adjusting the formula with the aid of the statistical data. This is what has always been done when a fixed lag is involved. The only new feature in the distributed lag is that two parameters are used instead of one. Only in case the number of parameters adjusted were comparable with the number of items in the statistical series studied, would such adjustments decrease the significance of the results and be open to the charge of curve-fitting or forcing.

My method of distributed lag will be fully described in a forthcoming book of my former associate, Dr. Max Sasuly, entitled, *Trend Analysis of Statistics: Theory and Technique*, published by the Brookings Institution. The method was also briefly described in my "Unstable Dollar and the So-Called Business Cycle", *Journal of the American Statistical Association*, June 1925, pp. 179-202.

In brief the method is this: Instead of assuming that the whole effect of any economic cause (such as a price level change) is felt all at once after a fixed time-lag, it is more reasonable to assume that the effect is spread over a period of time according to some distributive law. Various laws of distribution, including the normal law of distribution of errors or chance, were tried. The law which, of all those tested, gave the best results was as follows: the effect of a price level change, occurring in or at a given month, will be most felt in the following month, and the effect will thereafter gradually taper off by equal degrees each successive month until it reaches zero.

In the present case, the effect of the price level change at any month is distributed over the following 33 months in proportion to the numbers 32, 31, 30, ..., 2, 1, 0.

The total effect, in any one month of the price level changes in preceding months, is then easily found by summation, after separately calculating all such effects—that is, the effect of the price change located one month back is added to the effect of the price change located two months back and these are added to the effect of that located three months back, and so on, to 33 months back, when it disappears.

For rough purposes a still simpler rule may be applied: (1) measure the price change in any month by the arithmetical difference between the index number of the preceding and succeeding months (instead of by said difference as a percentage of the index number for that month); (2) assume that the effect of the price change disappears in a certain length of time, and divide this time into three nearly equal parts; (3) if this tapering off period is assumed to be, say, three years, or 36 months, assume further that the effect of said price change in each of the first twelve months is measured by a figure twice the figure measuring the price change, but in each of the last twelve months by once that figure, and in the middle twelve months by a figure half-way between. Thus, if the price change at March is +4 points, then for each of the first twelve months, beginning with April, the measure of the effect is the number +2 (i.e. 2×4); for each of the last twelve months, +4, and for each of the intervening 12 months, +6.

We may therefore conclude with substantial certainty that, in the United States at least, employment falls as a result of deflation and is restored by reflation, with remarkable persistence.

A similar relation with a shorter lag (namely 25 months instead of 33) was found to prevail between price-change-with-a-distributed-lag and the volume-of-trade, or production.* In the following Chart (11), this relationship has, for the first time, been calculated beyond 1922 and brought down to date. For the whole period the same striking correspondence is found, again sustaining the conclusion that deflation depresses trade and reflation revives it.

In my original study, this conclusion was further supported by extending the study backward to 1877, so far as the data permitted, the data before 1903 being quarterly instead of monthly. Naturally, with rougher data, the correspondence was rougher. And for other countries, where the criteria of booms and depressions are still rougher, the correspondence is still rougher.

Method IV Continued: Other Countries

If we are to make similar studies for other countries, we must have not only price level figures from which to construct \bar{P} , but also figures of business conditions. The most extensive collection of information on business conditions prevailing in different countries, during the last five depression years, seems to be that contained in three reports of the League of Nations.** Each such report contains a diagram in which a series of symbols depicts, quarter by quarter, the course of business conditions in some thirty countries.† The only way in which this material can be compared with the \bar{P} for each country is by translating the League of Nations' symbols into curves. This translation, however, is difficult, because the League of Nations' symbols indicate only qualitative changes in business conditions, not quantitative ones; that is, they show changes in the direction of each curve but not the degrees of such changes. And even the qualitative changes are, in each case, merely relative to the preceding quarter.

*The two curves are T (the volume of trade or production) and \bar{P} (i.e. what the volume of trade or production would be if its fluctuations were solely due to the effects of price-level changes, according to the theoretical formula). T is essentially an index of production rather than trade. The data are those of Professor Warren M. Persons, *Review of Economic Statistics*, Vol. XV, 1933, p. 157.

**Course and Phases of the World Economic Depression, published by the Secretariat of the League of Nations, Geneva, 1931, and *World Economic Survey 1931-32 and 1932-33*, League of Nations, Geneva, 1933.

†The number of countries covered differs in the three reports.

With such vague data, it would, of course, be possible, by arbitrarily assuming suitable degrees of change (i.e. making the direction of each segment of the curve steeper or less steep, to suit myself, within the limits compatible with the vague League of Nations' specifications) to improve the correspondence between the curves and the price-change curves; but this would be without any fixed rule and therefore without any warrant except the natural presumption deduced from the American case for which there are more adequate data. But rather than take advantage of defective data and thereby to subject the method to criticism (which in this case would be justified), I have gone to the other extreme and interpreted all the League of Nations' symbols according to a uniform, arbitrary, convention.* I have allowed myself only the usual privilege of choosing the scale for plotting each curve after it has been constructed.

To all these difficulties must be added the difficulty that the depression data on which the League of Nations' diagrams are based are only available for quarters, not months, are not uniform for all countries, and are not, in any case, exactly defined. Sometimes the data are production and unemployment, sometimes the value of foreign trade and harvest returns. These and other various factors could not all be expected to lag in the same way behind price change, and therefore we cannot expect that any law of lag adopted will be equally well fitted to all the various cases. In fact, the curve is not only arbitrary in degrees of slope, as already indicated, but it is neither flesh, fish, nor fowl. It cannot properly be labeled E (employment) nor T (trade, or production). It is therefore labeled B (business conditions, whatever that may mean). For simplicity and rough and rapid calculation, I have employed a lag distributed over two years, the effect disappearing in the last quarter, and have used a short-cut method similar to that described in a preceding footnote.

With such rough, defective, and variable data available, it is inevitable that the results should be of comparatively little significance. Such as they are they are presented in Chart 12. On the whole, they tend to confirm the conclusions already suggested. In a few cases, the results are, perhaps, better than one would have expected, namely for Argentine, England, Australia, India and Germany. In other cases, there is little or no correspondence; namely, in the cases of the Netherlands, Denmark, Finland, Yugoslavia, and Austria. In

*In certain cases, the arbitrary convention adopted produced curves that were self-contradictory. In these few cases another uniform convention, equally arbitrary, was used.

each of the remaining cases there is at least an appreciable resemblance between the two curves (\bar{P} and B).

It is interesting to note that, even in the case of the United States, the comparison of \bar{P} with the B curve, based on these indeterminate League of Nations' data, shows only a moderate degree of correspondence, whereas we already know that, with monthly and more accurate data, there is, in general, a very close correspondence—with one notable exception referred to below. (See Charts 10 and 11.)

In these two charts (10 and 11) for the United States we see that, from the middle of 1931 to the middle of 1932, the correspondence is less than for any other one-year period studied. And what is even more interesting, this same dissimilarity from mid '31 to mid '32 is found in the case of almost every country included in Chart 11, the only notable exceptions being England, India, Argentina and Australia. In fact, this one year's discrepancy is what bulks large in these charts. Without it, the \bar{P} curve and the curve B (business conditions) would show a general correspondence in almost every case. That this discrepancy stands for something real and is not merely accidental, nor due merely to inaccurate data, seems very probable, both because we find it in Charts 10 and 11 (for which accurate data were used) and because the phenomenon for this period is common to all but four of the countries. We may therefore conclude that, for this 1931-32 period some non-monetary factor dominates and was present almost all over the world.

The Discrepant Year 1931-32.

What can the non-monetary factor or factors be?

I feel extremely diffident in attempting to answer that question, and my answer must accordingly be extremely tentative. It may better be called a guess. My hope is that others, better fitted by knowledge of international conditions than I to assess the many forces which were at work in 1931-32, may find ways and methods to test my very simple hypothesis, which is:

That the B curve, for the year 1931-32, was put out of line by new tariffs and other trade impediments following the growth of "nationalism", and also by the sudden and unforeseen developments in the international debt situation. Not only do debts and debt-liquidation affect business conditions indirectly through the medium of deflation, so as to register in \bar{P} in the chart, but they doubtless also affect business directly, especially if the business world suddenly awakens with a shock to their dangerous magnitude.

The international reverberations of the important events of 1931 must have revealed to many people, for the first time, the colossal magnitude of the depression and the dismal fact that a big part of it was, or rather was believed to be, beyond domestic control.

This period, especially with reference to Europe, is covered in considerable detail by the pamphlet of the Economic Intelligence Bureau of the League of Nations published in 1932 under the title *World Economic Survey, 1931-32*. I quote a few passages (p. 70): "In the spring of 1931, as in the spring of 1930, there seemed to be a definite easing of economic and financial conditions. . . . money-market rates were extremely easy in the chief financial centres.

"In past crises, such conditions . . . have always been the precursor of recovery from depression; but in 1931 the financial weakness of the borrowing countries, and of the borrowers within the industrial countries, was such that improvement did not follow. It is significant that none of the debtor countries, with the exception of Roumania on April 1st, was able to reduce its discount rates."

(P.79) After recording the abandonment of the gold standard and some of the consequences, the pamphlet says: "Even more important in the immediate situation, however, was the reaction upon the remaining gold standard countries and upon the financial structure of the world as a whole bank rates rose, foreign exchange restrictions, ranging from limitation of imports to moratoria, were imposed in thirty different countries; tariffs were increased; contingent priority and quota systems introduced.

"Partly as a result of these trade restrictions, the financial storm burst with redoubled force on Germany, which on November 19 applied to the Bank of International Settlements for the convocation of the Consultative Committee provided for by the Young Plan."

(P.80) ".....The panic passed, and in the spring of 1932 there was lethargy, a state of suspended animation—rather than feverish action. But in the meantime, the fundamental difficulties of the crisis were sensibly aggravated".

There were also (p. 81) "violent reversals of the normal flow of capital movement, involving altogether unprecedented gold shipments and accumulations, having completely disorganized world trade. The world's creditors have not only stopped lending but have been drawing in both interest and capital The international economic situation thus created is comparable only with that which would result if all the banks in a developing mercantile community

were to refuse new accommodation and press for both interest payments and reduction of overdrafts."

(P.81) "Throughout 1931 and the first half of 1932, Europe held the center of the stage, with only occasional attention directed to the United States. But the financial situation of the rest of the world for the most part grew steadily worse also."

It may be worth noting that the discrepant year 1931-32 coincided with the year of the famous Hoover Moratorium, supposedly the greatest and most widely known moratorium in history. Whatever its real or ultimate value, it strengthened the growing impression in each nation that the depression "came from abroad" and created a sudden realization of its great magnitude. It also led to international recriminations. It brought a sudden sense of relief to Germany and England. Is this why, in 1931-32, the B curves for Germany and England did not show the discrepancy so persistent for other countries (especially France and the United States where the public believed that the very burden of which Germany and England were to be relieved was to be unloaded on them)?

Perhaps these guesses are wide of the mark, but I offer them for what they may be worth. The methods here used of international comparisons have at any rate shown that something exceptional must still be found to explain 1931-32.

But, with the exception of 1931-32, it seems that the depression has been, in each country, chiefly ruled by its changes of price level. And since we have found that these changes differ with different monetary standards, it ought naturally to follow that the virus of depression is carried from one country to another via a common monetary standard as the conduit. That is, one gold standard country infects another until they all come down with the depression disease, while those countries not on the gold standard are relatively immune.

Not only are these conclusions plausible *a priori*, but they correspond to the facts above set forth.

Other Confirmations.

There are also other confirmations. Some countries not included in the above comparisons present certain corroborative facts even if we cannot always express these in a statistical series. For instance, Mexico went off gold in August '31 and thereafter (according to the not very dependable price indexes available) had a more stable price level than countries on gold, and also less depres-

sion (according to the testimony of merchants in Mexico in a position to make comparisons).

In China also we find that, while gold standard countries were suffering depression during falling prices, China was having something like a boom with rising prices, during 1930 and the first half of 1931. One of my Chinese correspondents, who desires that his name shall not be mentioned, wrote, under date of January 18, 1934:

"One of the most important phases of the situation relates to silver. Consideration must be given to the effect of changes in the value of silver upon economic conditions in China. At present, China has felt the effects of the current depression relatively less than the rest of the world, apparently due in large part to the fact that prices on the silver standard (and it might be said on the copper coin standard obtaining in some parts) have not undergone the deflation which occurred elsewhere. Moreover, the falling value of silver made imports relatively more costly and served to stimulate many local industries much as a protective tariff does. During the current year, however, there are signs of a change coincident with the higher level for silver in terms of depreciated currencies, notably the pound, United States dollar and yen. With China remaining on a hard money basis, somewhat analogous to that of the gold countries of Europe, imports have tended to become cheaper and exports harder to sell in competition with suppliers enjoying the stimulus of unsound currencies. This condition tends to bring about a sort of deflation in China.

"Owing to the conditions stated, many observers feel that, in the last 18 months, whatever progress toward improvement has taken place in other countries that has not been matched in China."

Incidentally we may here observe that the recently proposed raising of the value of silver, which interested parties would have us believe would help China, would more likely hurt her greatly in the same way that gold countries have been hurt by the appreciation of gold.

There is also Spain. Spain has not been on the gold standard since the war; and her price level has remained fairly steady. The depression did not, apparently, come to Spain until 1932.

Conclusions.

The observation that depressions travel internationally, or at any rate occur in one country after another in rapid succession or simultaneously, is not new. It may almost be called common knowledge. But the facts that the infection is carried chiefly via the monetary

standard and that without such a conduit there is little infection are less well known. With one noteworthy exception (the period 1931-32), the statistics and the methods used in this paper sustain this conclusion and strengthen the growing evidence that great depressions are largely of monetary origin. Indeed, if this were not true, such disagreements as those found in 1931-32 would be general instead of exceptional.

That exception is worthy of further study and may well disclose some important additional conduit besides the monetary one.

At all events, what we have learned puts us in a position to consider whether booms and depressions and their spread from land to land are to be accepted in a spirit of fatalism, or resisted. Surely, they are to be resisted. They can be forestalled or, at any rate, greatly mitigated. For, since the price of gold is a chief determinant of the price level (where the monetary standard is gold) and since the price of gold in terms of the money of any given country is controllable, it follows that in gold countries we can, through the regulation of gold, largely regulate a chief cause of booms and depressions—the price level. This has been shown by Professors Warren and Pearson in *Prices* and has been exemplified in America by the gold policies of President Roosevelt, as well as in Australia under the influence of Professor Copland—not to mention New Zealand.*

Nor is this reason for hope to be surrendered merely because, especially in 1931-32, other than price-level factors join in the derangement of production and employment, etc. A sea-captain avoids the rocks, not by controlling wind and wave, but by controlling his rudder alone. Gold control is comparable to rudder control.

*Besides gold as a lever for controlling prices there is, also, as is now well known, credit control. This has been exemplified in America and even more fully in Sweden, which has succeeded in maintaining its (retail) price level always within two per cent and usually within one per cent of its chosen par. It is beyond the scope of this paper to discuss the significance of Sweden's splendid achievement. Suffice it to say, therefore: (1) Swedish experience, independently of any other, indicates that, under reasonable conditions, it is possible for any country off gold to attain and hold any chosen price level, by means of credit control, under a unified banking system; (2) Sweden would have done still better if she had not given so much weight in her index to foreign goods and if she had reflatd her price level first, as Australia did and as America is now doing, instead of perpetuating the price level of September 1931, which was too low; (3) the heated attempts of President Roosevelt's opponents in America to discredit Sweden's experiment, including the claim that she obtained little or no advantage from it, since her internal wholesale price level fell slightly, have been answered by events; latterly, the Swedish wholesale prices have risen and a League of Nations' statement recently quoted in American newspapers gives Sweden first place in recovery among European countries.

Nor is gold the only control at our disposal. Consider, for a moment, the experiences of the Sterlingaria group in which gold was not a factor. The countries of that group, instead of controlling or regulating the price of gold, pursued the policy of maintaining a constant rate of exchange on London. I do not know that their purpose was to keep their respective price levels at par with England's price level, but this was the effect, and had it been their purpose they would have achieved it in precisely the same way. Some observers even surmise that England, for her part, is now aiming at price-level stabilization through some form or forms of monetary control, of which gold price and rate of exchange are, after all, only two types out of several which are available.

But if, by monetary control, booms and depressions can be forestalled or mitigated within a nation, the international transmission of them can also be forestalled by any nation, through monetary means, that is by cutting loose from the standard which transmits or threatens to transmit the booms and depressions to it from other countries. After thus closing the "lock", it can thenceforth control its own internal price level; and, through the price level, it can control, in some degree, its booms and depressions also.

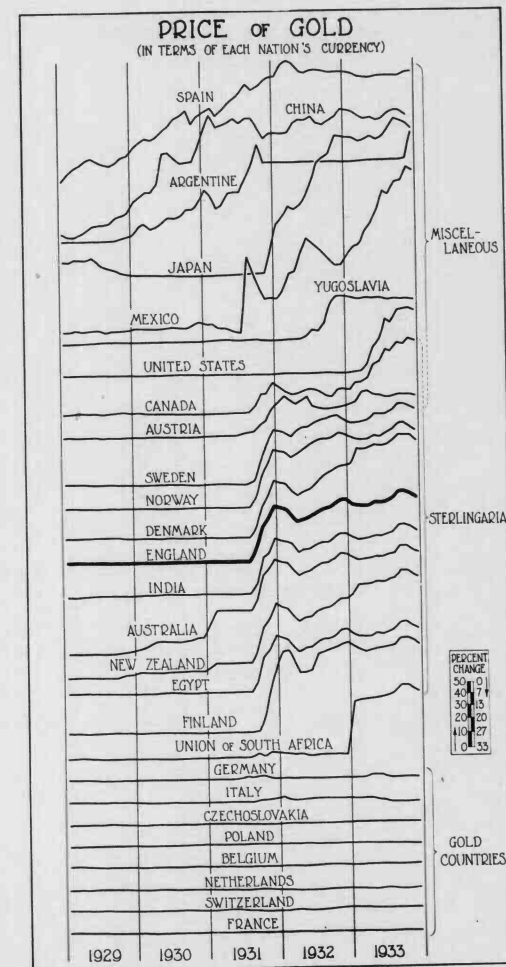


CHART 1. Showing the price of gold in terms of the currencies of countries with: Miscellaneous standards; "Sterlingaria" standard; Gold standard.

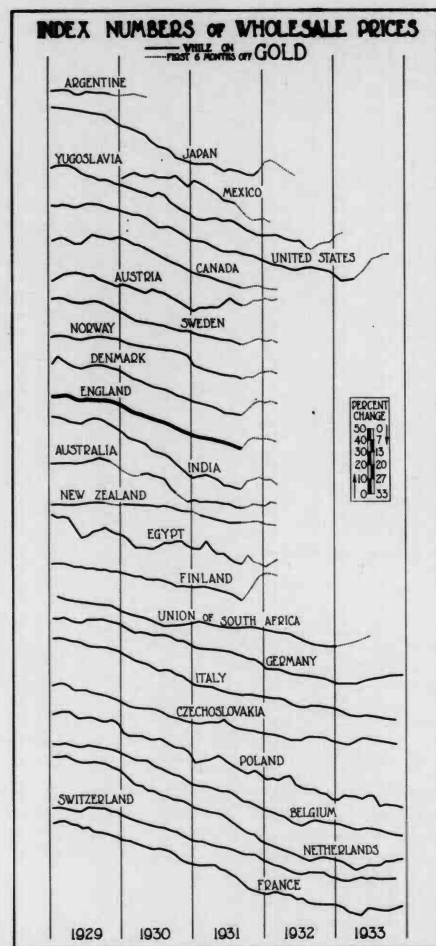


CHART 2. Comparing wholesale commodity price movements of 25 countries while "on Gold".

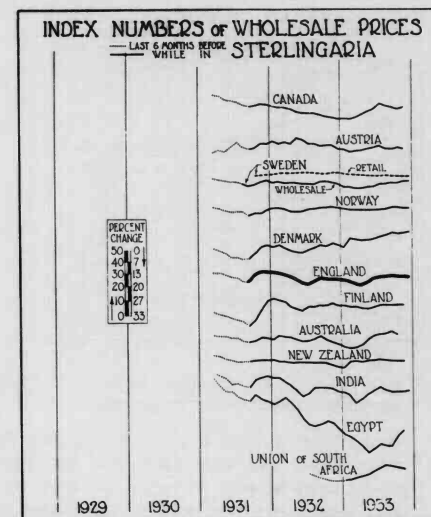


CHART 3. Comparing wholesale commodity price movements of 12 countries while "on Sterling".

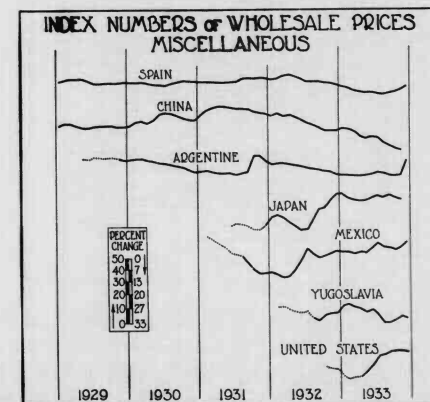


CHART 4. Contrasting wholesale price movements of 7 countries while on miscellaneous standards.

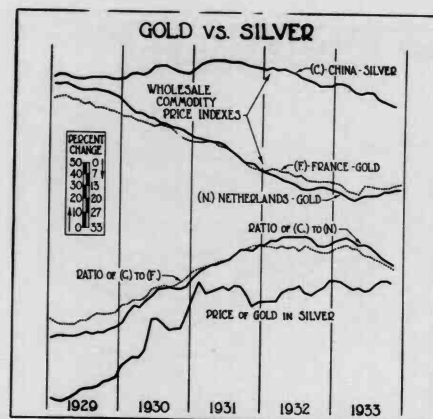


CHART 5. Contrasting wholesale price movements between Silver and Gold countries; also comparing price of gold in terms of silver with price level in a Silver country (measured relatively to wholesale price level in Gold countries).

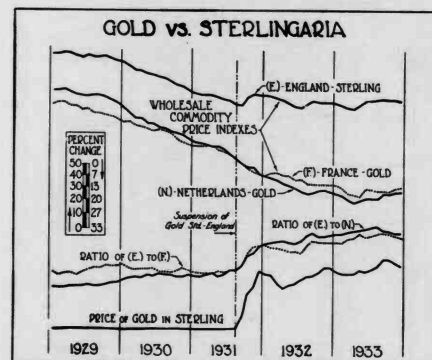


CHART 6. Comparing price movements between England (both before and after going off Gold) with two typical Gold countries; also comparing price of gold in England (before and after) with her wholesale price level (measured relatively to said Gold countries).



CHART 7. Comparing price of gold in Mexico with her wholesale price level (measured relatively to Netherlands as a typical Gold country).



CHART 8. Comparing price of gold in Mexico with her wholesale price level (measured relatively to United States).

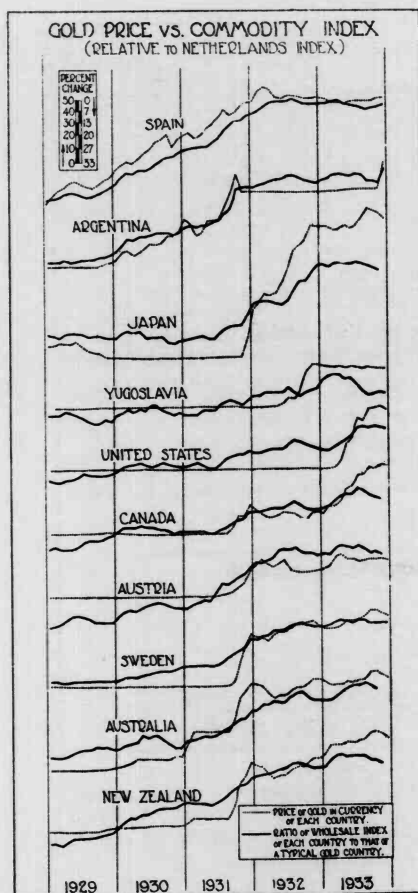


CHART 9. Comparing price of gold in each country not previously so compared (either directly or as represented by a typical country in its group) with its wholesale price level (measured relatively to Netherlands as a typical Gold country.)

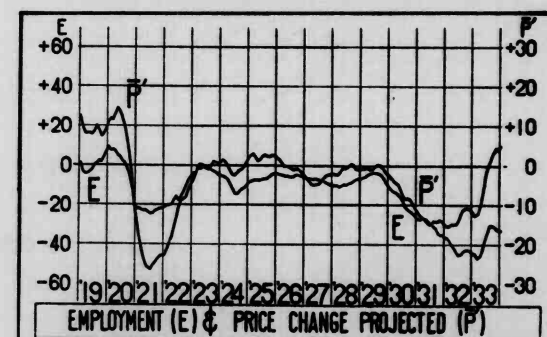


CHART 10. Comparing E (employment) for each month with \bar{P} for that month (\bar{P} being a weighted average of the price movements of the 33 preceding months).

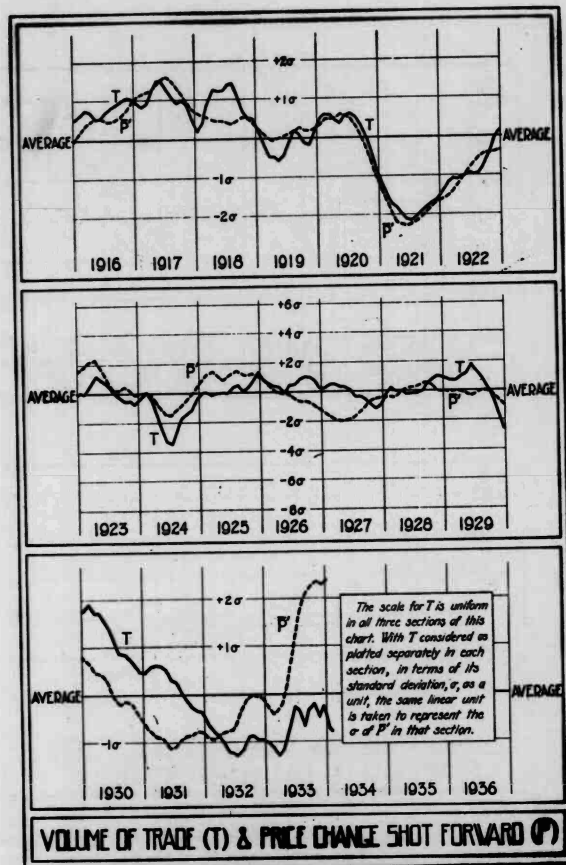


CHART 11. Comparing T (trade) for each month with \bar{P} for that month (\bar{P} being a weighted average of the price movements of the 25 preceding months).

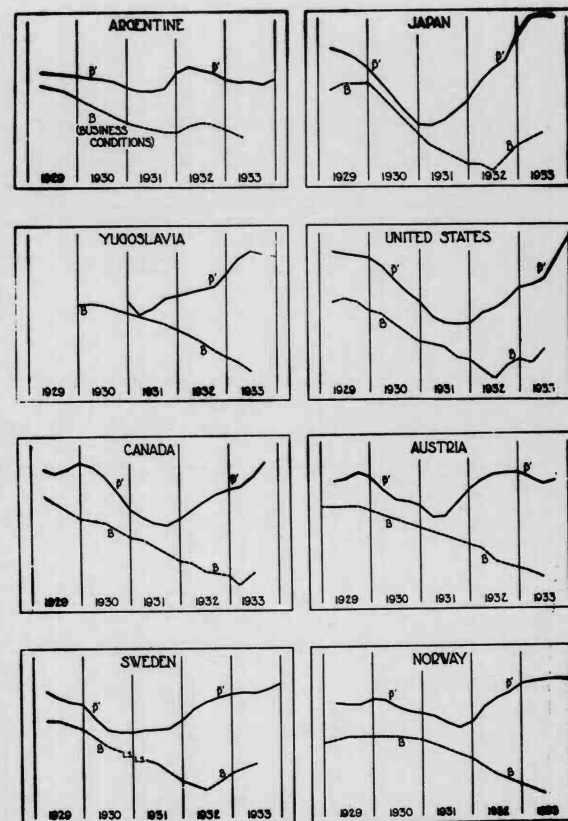


CHART 12A. Comparing B ("Business Conditions") for each quarter with \bar{P} for that quarter (\bar{P} being a weighted average of the price movements of the preceding 8 quarters). ("L.S." means "lock out" or "strike").

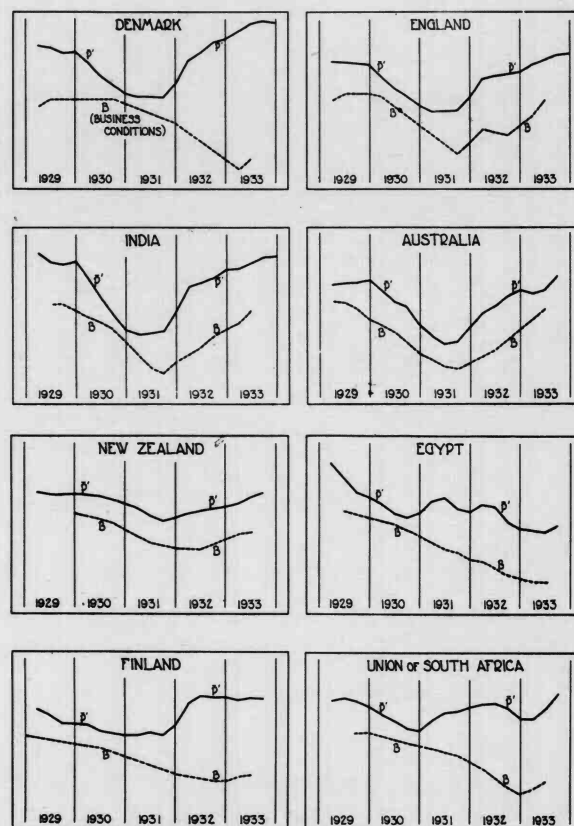


CHART 12B. Comparing B ("Business Conditions") for each quarter with \bar{P} for that quarter (\bar{P} being a weighted average of the price movements of the preceding 8 quarters).

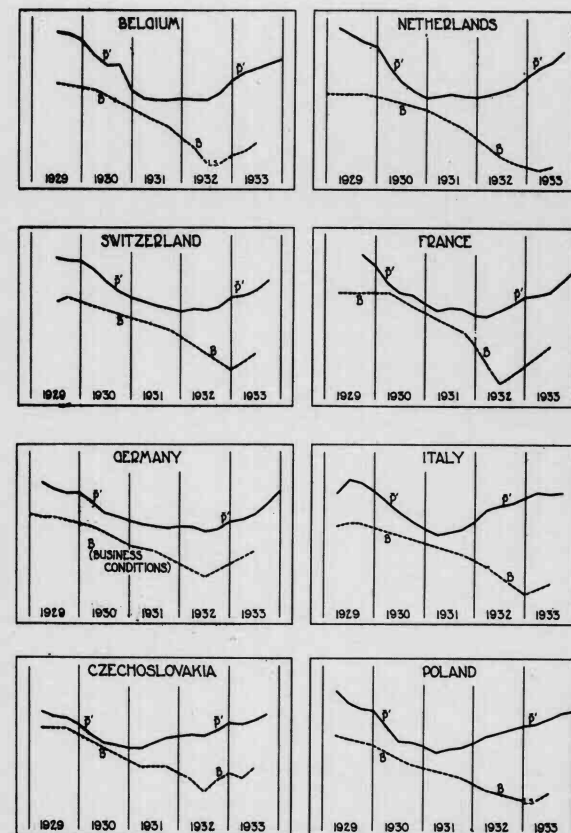


CHART 12C. Comparing B ("Business Conditions") for each quarter with \bar{P} for that quarter (\bar{P} being a weighted average of the price movements of the preceding 8 quarters). ("L.S." means "lock out" or "strike").

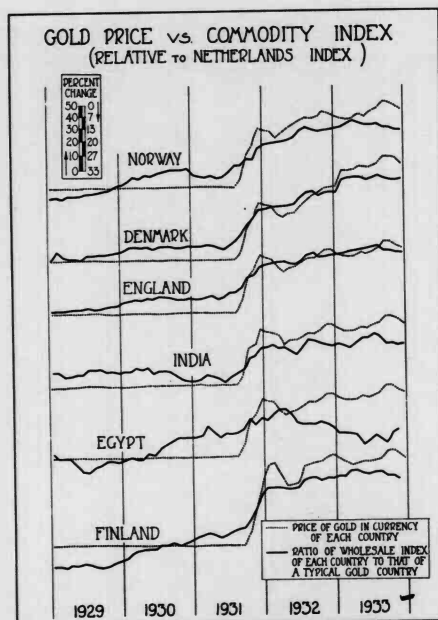


CHART 13 Comparing price of gold in each country, not already included in Chart 9 (nor in Charts 5, 6 and 7), with its wholesale price level (measured relatively to Netherlands as a typical Gold Country).

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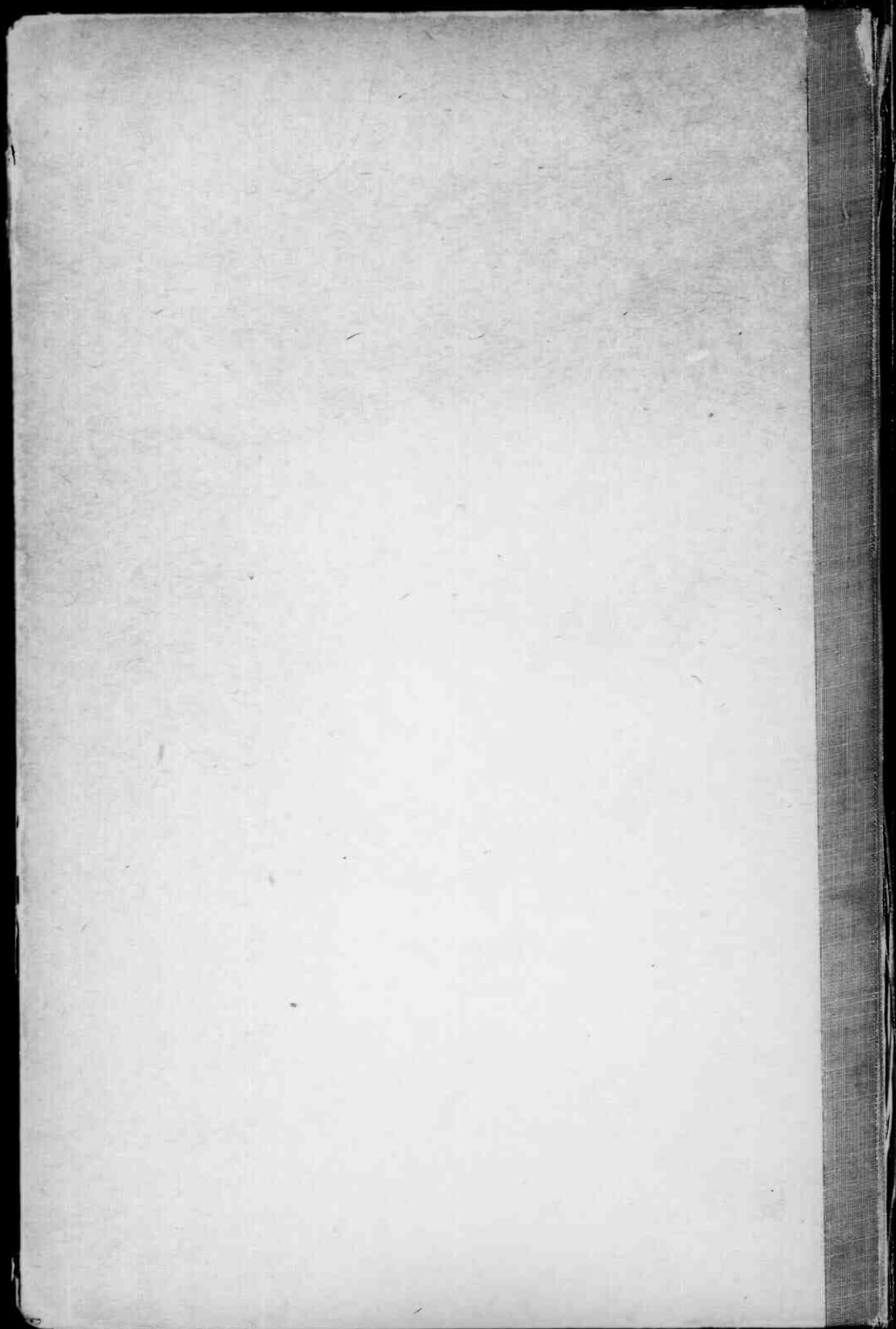
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